

15. (Amended) The apparatus of claim 13 and wherein said SLM is constructed for operation in a reflective mode.

Please cancel claims ~~2, 3 and 11~~, without prejudice.

REMARKS

The references cited by the Examiner in the rejections of the claims along with the Examiner's comments in the above noted Office Action have been diligently studied. Reconsideration of the application in light of this amendment is respectfully requested.

Claims 1, 4, 12, 14 and 15 have been amended. Claims 2, 3 and 11 have been canceled. No new claims have been added. Therefore, claims 1, 4-10 and 12-15 are under active consideration.

Claims 14 and 15 stand rejected under 35USC112, second paragraph on the grounds that they are depend from claim 17, which does not exist. In this Amendment these two claims have been amended so that they now depend on claim 13. Withdrawal of the rejection is respectfully urged.

Claims 1-10 and 12-13 stand rejected under 35USC103 as being unpatentable over Danko (U.S. 5,659,390).

As noted above, claims 2, 3 and 11 have been canceled. As to the other claims, namely claims 1, 4-10 and 12-15, the rejection is respectfully traversed.

It is respectfully submitted that the above noted claims define an apparatus that is patentably different from Danko.

Applicant has invented an apparatus and method for detecting particles on a surface of a semiconductor wafer having repetitive patterns includes a laser for illuminating an area on the front surface with a beam of polarized light. A lens collects light scattered from the

area and forms a Fourier diffraction pattern of the area illuminated. A Fourier mask blocks out light collected by the lens at locations in the Fourier diffraction pattern where the intensity is above a predetermined level indicative of background information and leaves in light at locations where the intensity is below the threshold level indicative of possible particle information. The Fourier mask includes a spatial light modulator and a polarization discriminator. A camera detects scattered light collected from the area by the lens and not blocked out by the Fourier mask. In one embodiment of the invention the spatial light modulator is optically addressable and in other embodiments of the invention the spatial light modulator is electrically addressable. The electrically addressable versions include a processor and an SLM controller.

Danko discloses an apparatus for detecting particles on the front surface of a patterned semiconductor wafer having repetitive patterns which includes a laser for illuminating an area on the front surface at grazing angle of incidence with a beam of polarized light. A lens collects light scattered from the area and forms a Fourier diffraction pattern of the area illuminated. A Fourier mask blocks out light collected by the lens at locations in the Fourier diffraction pattern where the intensity is above a predetermined level indicative of background information and leaves in light at locations where the intensity is below the threshold level indicative of possible particle information. The Fourier mask includes an optically addressable spatial light modulator and a crossed polarizer with the Fourier diffraction pattern being used as both a read beam and a write beam for the spatial light modulator. A camera detects scattered light collected from the area by the lens and not blocked out by the Fourier mask.

For example, all of the claims call for an LCD for converting the output of the

processor into a video image whereas in Danko there is a CRT for converting the output of the processor into a video image. No mention is made in Danko concerning the use of an LCD in place of a CRT. Accordingly, in the absence of a teaching or suggestion in Danko for substituting and LCD for the CRT in Danko there would be no basis for making the substitution suggested by the Examiner.

As another point, claim 1 calls for a polarization discriminator which is in the form of a polarizing beamsplitter. In Danko, the polarization discriminator is in the form of a polarizing beamsplitter. Thus, applicant's apparatus in the instant application is structurally different from Danko.

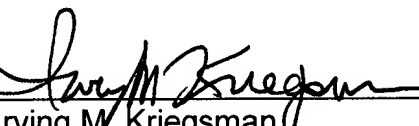
Claims 12 and 13, amongst other things call for an electrically addressable SLM and a controller. None of these structural elements are found in Danko.

It should also be noted that Danko does not show an SLM constructed for operation in a transmissive mode as called for in claim 14.

Withdrawal of the rejection is respectfully urged.

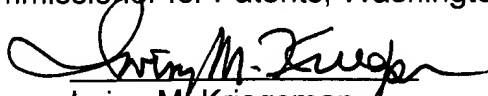
Allowance of the application with claims 1, 4-10, and 12-15 is earnestly solicited.

Respectfully submitted,
KRIEGSMAN & KRIEGSMAN

By: 
Irving M. Kriegsman
Reg. No. 22,733
665 Franklin Street
Framingham, MA 01702
(508) 879-3500

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Box Fee Amendment, Commissioner for Patents, Washington, D. C. 20231 on 9-23-02.


Irving M. Kriegsman

MARKED-UP AMENDED CLAIMS 1, 4, 12, 14 AND 15

1. (Amended) Apparatus for detecting particles on a surface of a semiconductor wafer, said surface having repetitive patterns, the apparatus comprising:

a. a laser for illuminating an area on said surface with a beam of polarized light,

b. a first camera,

c. a first imaging lens for collecting light scattered from said area, said first imaging lens forming a Fourier diffraction pattern of light scattered from said area illuminated,

d. a Fourier mask for blocking light in said Fourier diffraction pattern where the intensity is above a predetermined level indicative of background information and leaving in areas where the intensity is below said predetermined level indicative of particle information, the Fourier mask including a spatial light modulator (SLM) which is optically addressable and a polarization discriminator in the form of a polarizing beamsplitter,

e. a second camera,

f. a second imaging lens for imaging the Fourier diffraction pattern formed by the first imaging lens into the second camera, said second camera converting the image of the Fourier diffraction patterns into a stream of digital electrical signals,

g. a processor for processing the stream of digital electrical signals formed by the second camera,

h. a liquid crystal display (LCD) for converting the output of the processor into a video image, and

i. a third imaging lens for imaging the video image of the LCD onto the SLM,

j. said first camera recording the image of the area imaged by said first imaging lens using scattered light not blocked by said Fourier mask.

4. (Amended) The apparatus of claim [3] 1, wherein said laser produces a plane polarized beam of light.

12. (Amended) Apparatus for detecting particles on a surface of a semiconductor wafer, said surface having repetitive patterns, the apparatus comprising:

a. a laser for illuminating an area on said surface with a beam of polarized light,

b. a first camera,

c. a first imaging lens for collecting light scattered from said area, said first imaging lens forming a Fourier diffraction pattern of light scattered from said area illuminated,

d. a Fourier mask for blocking light in said Fourier diffraction pattern where the intensity is above a predetermined level indicative of background information and leaving in areas where the intensity is below said predetermined level indicative of particle information, the Fourier mask including a spatial light modulator (SLM) which is [optically] electrically addressable and a polarization discriminator,

e. a second camera,

f. a imaging lens for imaging the Fourier diffraction pattern formed by the first imaging lens into the second camera, said second camera converting the image into a stream of digital electrical signals,

g. a processor for processing the stream of digital electrical signals formed by the second camera, and

h. an SLM controller for applying the output of the processor into the SLM,
i. said first camera recording an image of the area illuminated by said first imaging lens and not blocked by said Fourier mask.

14. (Amended) The apparatus of claim [17] 13 and wherein said SLM is arranged for operation in a transmission mode.

15. (Amended) The apparatus of claim [17] 13 and wherein said SLM is constructed for operation in a reflective mode.